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STATE OF ALASKA

William A. Egan, Governor

ANNUAL REPORT OF PROGRESS, 1963 - 1964

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-5

SPORT FISH INVESTIGATIONS OF ALASKA

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INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-5, "Sport Fish Investigations of Alaska."

The project is composed of 25 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. Of these, eight jobs are designed to continue the cataloging and inventory of the numerous State waters in an attempt to prepare an index of the recreational waters. Four jobs are designed for specific sport fishery creel census while the remainder of the jobs are more specific in nature. These include independent studies on king salmon, silver salmon, grayling, Dolly Varden, a statewide access evaluation program, egg take program and a residual toxaphene study. The information gathered from the combined studies will provide the necessary background data for a better understanding of local management problems and assist in the development of future investigational studies.

The subject matter contained within these reports is often fragmentary in nature. The findings may not be conclusive and the interpretations contained therein are subject to re-evaluation as the work progresses.

Volume 5 Report No. 1-A

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

STATE: ALASKA Name: Sport Fish Investigations of Alaska.

Project No: F-5-R-5 Title: Inventory and Cataloging of the Sport Fish and Sport Fish Waters in Lower Southeast Alaska.

Job No: 1-A

Period Covered: May 1, 1963 to April 30, 1964.

Abstract:

Assessment of the sport fishery in the southern half of southeast Alaska was continued through 1964. The current physical aspects of the freshwater and marine environments were noted. Sport catch was recorded by creel census. Lake surveys were done in the detail warranted. Species distribution of sport fish was checked. Facilities for anglers, necessary both presently and soon, were listed. The search for a good spawn taking location for indiginous sport fish was continued. Watershed uses were kept under surveillance and their effects on sport fish noted. Recommendations for the management of the sport fishery were made from the findings of the project.

Recommendations:

1. No changes in the present regulations on resident freshwater game fish are necessary.

2. The anadromous fish, as they occur in fresh water, may require more intensive management as the human population of the area increases and more waters become accessible by road.

3. The saltwater sport fishery needs no further restrictions at the present time.

4. Continue the exploratory and investigative work of the past year.

5. Make note of, and report to the proper agency, development needs to facilitate angling on fish populations presently receiving little or no angling pressure.

Objectives:

To determine the current status, potential and public availability of Alaska's sport fishing waters in order to direct future management investigations.

To assess environmental characteristics and formulate plans for application of restoration measures, availability of sport fish egg sources for experimental needs, population manipulations and catch data as acquired by periodic creel census.

To evaluate watershed development projects from the standpoint of multiple use and proper protection of the sport fish resources.

Techniques Used:

Exploratory surveys employed a number of investigative procedures to establish factual information on the waters under consideration. Included were the use of variable mesh gill nets, temperature checks, water quality checks, depth soundings, spin-fishing gear and visual observations. From these activities the presence or absence of fish could be determined along with the reasons for the relative condition of the waters under study.

Due to heavy angler utilization, the most complete surveys were done on waters within reach of the road and trail systems at Ketchikan. These surveys included a contour map of the lake bottom, appraisal of present and possible access routes and management techniques recommended to improve fishing.

Waters considered to have great potential, but which were in need of exploratory work, were also checked. Here visual checks and test fishing with sport gear generally revealed the presence or absence of fish population. Many of these waters failed to give evidence of fish populations and may lend themselves to introductions of resident sport species.

The angler preference and take of marine fish was determined through creel census. The location of catch was recorded. Facilities for angler use were assessed and noted in the district. Weather was often a controlling factor because sport boats were frequently unable to cope with heavy seas.

Species distribution and migration were also determined by creel census. Size and age composition of the catch were noted where possible.

Physical and chemical characteristics of the lakes and streams have been noted in previous reports. Visual inspection is frequently sufficient to assess waters as marginal or negative for fish environments. Inlet and outlet streams of lakes were assessed for suitability for spawning and rearing areas. Water flows, barriers to fish passage and other factors affecting fish habitat were noted. Note was made of the surrounding terrain and its influence on the lakes and streams under study.

Surveys were conducted, in conjunction with other work, to locate suitable areas that would serve as salmonoid spawn taking sites. The conditions to be met include adequate fish runs, suitable physical properties of the sites and accessibility.

Water-use, gravel removal, mineral development and logging applications are appraised, as received, for the various aspects of change the proposed use will bring about and the effects on the sport fishery.

All information gathered was analyzed so that management recommendations could be made.

Findings:

A pattern of exploration was set whereby those waters previously incompletely investigated and relatively close to the road system at Ketchikan were checked out. A number of these waters had previously been noted, but not surveyed and these were further investigated. Others had never been listed and were checked out as thoroughly as required. Among waters in this general group were several void of fish. These were set up for stocking at the earliest opportunity so that they may furnish fishing when the projected access schedule is accomplished.

1. Whitman Lake

This lake is near Herring Cove, George Inlet, on Revillagigedo Island. It lies at an elevation of 346 feet and the surface area is 156 acres. The depth is 140 feet. The outlet is controlled by a power dam (not presently used as such). There is one major inlet at the head with a normal flow of 6 cubic feet per second. Eastern brook trout were introduced previously. However, fishing success, as a rule, is very poor in spite of the climax population. A volumetric survey was done and in the future, a rehabilitation is recommended.

2. Perseverance Lake

Perseverance Lake is located 3-1/2 miles north of Ketchikan on Revillagigedo Island. It has an elevation of 518 feet with a surface area of 207 acres. The depth is 160 feet. There are no major inlets. There is a normal flow of five cfs into Connell Lake at the outlet of Perseverance Creek. Eastern brook trout and rainbow were planted in 1931 and 1932. A volumetric survey has been completed.

3. Mahoney Lake

This lake is located off George Inlet on Revillagigedo Island. It has an elevation of 76 feet, a depth of 220 feet and a surface area of 155 acres. There are two inlets (not named) and the major one has an estimated normal flow of 20 cfs. The outlet, Mahoney Creek, has an estimated normal flow of 30 cfs. The outlet is quite steep with a falls that apparently is a barrier to all but sockeye, coho and steelhead. A volumetric survey has been completed.

4. Cliff & Steep Lakes (Not Official Names)

These lakes lie 4.5 miles northeast of Ketchikan at altitudes of 1,825 feet and 1,875 feet. They have maximum depths of approximately 50 feet and 40 feet respectively and surface areas of 22.1 and 7.6 acres respectively. The inlets are not named, being mostly talus seeps with a short stream connecting the two lakes. The outlet has no name and has a normal flow of 1.5 cfs. There are many steep falls

and cataracts at the outlet. No fish were noted and it is recommended that rainbow trout be planted at the first opportunity.

5. Heart Lake (Not official name)

Heart Lake lies northwest of Mahoney Lake on Revillagigedo Island. This lake lies at an elevation of 1,550 feet (USCG Topo.) and a visual survey indicates an estimated depth of 75 feet with an estimated surface area of 60 acres. There is no significant inlet; mostly talus slope seepages. The outlet drains into George Inlet near White River at an estimated normal flow of 3 cfs. There are many high falls. This lake will be more accessible soon via the projected extension of the South Tongass Highway. It is recommended that this lake be further studied for planting with rainbow trout.

6. Upper Mahoney Lakes (3) (Not official names)

These lakes lie between John and Mahoney Mountains, Revillagigedo Island. Visual survey was made and an estimated surface area of 140 acres (for the 3) was noted, with an estimated depth of 75 feet. The three lakes are chain connected and the outlet drains into lower Mahoney Lake at a normal flow of 5 cfs. There are many high falls. No fish were noted and it is recommended that these lakes be stocked with grayling.

A group of six lakes on Gravina Island in the vicinity of Judy Hill were also checked out by visual means. These waters are all relatively small, although several of them support fish. Eastern brook trout were planted here in 1931 and 1932 by the U.S. Forest Service but no present populations were found. None of these waters carry official names. They lie in a muskeg area with no established trails to them. All lie within less than two miles of Ketchikan. These lakes are as follows:

#1 Gravina Island (Ketchikan B-6)

This lake lies at an elevation of 90 feet off the head of Blank Inlet, Gravina Island. It has a depth of less than 50 feet and a surface area of 35.5 acres. There

are several small inlets on the east side from lakes above. The outlet has a normal flow of 1 cfs. There is a 15-foot vertical fall at the outlet. The lake has a climax population of cutthroat and stickleback and it is recommended that access be developed by establishment of trails.

#2 Gravina Island (Ketchikan B-6)

This lake is at the head of Blank Inlet, Gravina Island, at an elevation of 125 feet. It has an approximate depth of 25 feet and a surface area of 19.2 acres. The outlet drains into Tongass Narrows at a normal flow of 1 cfs. There is a climax population of cutthroat and it is recommended that access be developed by the construction of trails.

#3 Gravina Island (Ketchikan B-6)

This lake is at the head of Blank Inlet, Gravina Island. It lies at an elevation of 150 feet, with a depth of 10 feet and a surface area of 16.1 acres. The outlet was not flowing due to dry weather. There is a muskeg area around the lake of approximately 10 acres including some scrub timber area. There is a climax population of cutthroat. Access for anglers should be developed.

#4 Gravina Island (Ketchikan B-6)

This lake lies near the head of Blank Inlet, Gravina Island, at an elevation of 150 feet. It has an estimated depth of 4 feet and a surface area of 4.1 acres. There were no inlets or outlets flowing due to dry weather. There is a steep grade from the lake outlet to the beach. Stickleback were noted, but no trout were seen or taken. This lake was three feet below normal level when the survey was taken. It appears doubtful that a game fish population could be established here.

#5 Gravina Island (Ketchikan B-6)

This lake lies .3 mile northeast of the head of Blank Inlet, Gravina Island, at an elevation of 150 feet. The depth was estimated at approximately 25 feet with a surface

area of 5.1 acres. The inlet is from seepage only and the outlet drains at less than 1 cfs through Lake #1 into Blank Inlet. There is an old beaver dam at the outlet, three feet high, affecting the lake level. No fish were noted. It is recommended that this lake receive further survey.

#6 Gravina Island (Ketchikan B-6)

This lake lies northeast of the head of Blank Inlet, Gravina Island, at an estimated elevationof 145 feet with an estimated depth of 10 feet and a surface area of 5 acres. The normal flow is less than 1 cfs into Lake #2 and into Tongass Narrows. No barriers were noted except that the water level is insufficient most of the time for fish passage. There is a climax population of cutthroat and stickleback. No work is presently necessary on this lake, other than improvement of access.

A number of other lakes were surveyed to complete the inventory of the particular area or as opportunity permitted. Two of these, on the right entrance to Carroll Inlet, completed the surveys on the significant waters of the Black Mountain area. The Gold Standard Creek lakes in Helm Bay on the Cleveland Peninsula were visited and checked with sport tackle. These two lakes are seldom fished by local anglers.

1. Sprig Lake (Not official name)

This lake lies 1.7 miles magnetic north of Carroll Point, Revillagigedo Island, at an elevation of 150 feet. The depth is estimated at less than 20 feet and it has a surface area of 9.5 acres. The inlet is a small stream with a normal flow of less than 1 cfs from the lake above. The outlet has a normal flow of less than 1 cfs into Carroll Inlet. There are multiple beaver dams at the outlet and the grade is quite steep. No fish were taken on sport gear and no fish were observed. It is recommended that this lake be checked further to determine if planting is necessary.

2. Mallard Lake (Not official)

This lake lies 2 miles northeast of Carroll Point, Revillagigedo Island, at an elevation of 175 feet. The depth

is less than 20 feet and there is a surface area of 6.8 acres. The inlets consist of seepages and one small inlet with a flow of less than 1 cfs on the east side. The outlet drains into a small lake below at a normal flow of less than 1 cfs. There are multiple beaver dams in the outlet. No fish were noted. It is recommended that this lake receive further survey.

3. Lower Gold Standard (Not official)

This lake lies on the west side of Helm Bay, Cleveland Peninsula, at an approximate elevation of 85 feet. The depth was estimated to be less than 25 feet and the surface area was estimated to be approximately 20 acres. A stream draining one lake above is the main inlet and there are several others with a normal flow of 1 cfs. The outlet has a normal flow of approximately 10 cfs. There are several barriers in the outlet; one is a 20-foot vertical fall. The inlet contains a barrier to a lake above. This lake has long been known for good cutthroat fishing.

4. Upper Gold Standard (Not official name)

This lake lies on the west side of Helm Bay, Cleveland Peninsula, at an elevation of approximately 185 feet. A depth of approximately 75 feet is estimated by visual survey. The surface area is estimated at 65 acres. There is one inlet draining most of the area above, plus several lateral drains. The outlet drains into the lake below at an estimated normal flow of 9 cfs. There are falls immediately below the lake. No evidence of fishing pressure was observed at the lake, although cutthroat were not difficult to catch on bait. The population is considered to be at climax as no fish were observed over 8 inches in length.

A program of saltwater creel census was conducted, morning and evening, at the two most popular fishing locations adjacent to Ketchikan and on the road system. Here the number of boats was recorded and anglers contacted upon completion of their angling. A number of boats that fished regularly, which were recognized to be more successful than the average based in Ketchikan, were not contacted. It is known that this biased the data to show a lower catch

than took place. Within the financial limitations, it was the best that could be done.

The data collected in the saltwater creel census show the average king salmon taken in the sport fishery at Ketchikan ranged from 28.25 lbs. in May to 13 lbs. in August and raised to 17.5 lbs. in September. The fishery at Bell Island showed significant numbers of fish only during June (21.1 lbs. average weight) and July (16.9 lbs. average weight). Silver salmon showed an increase from 5.75 lbs. in June to 9.2 lbs. in September, which is normal. The seasonal average time taken to catch a king salmon at Ketchikan was 49.1 hours, while at Bell Island it was 6.8 hours. Silver salmon are usually an incidental catch with kings first preference.

The heaviest catch of incidental fish coincides with the peak of the salmon fishery. Halibut and rockfishes make up the bulk of this catch.

The sport salmon anglers of Ketchikan fished more heavily in the evening than in the morning; approximately three times as much effort is expended during the afternoon hours. The ratio of commercial anglers to sport anglers was 1 to 2 with the extreme of 1 to 15 during June and the height of the salmon derby. Normally, two anglers fished per boat with larger craft trending the average upward.

More anglers fished the Clover Pass Area than at Mountain Point. This may be due to more protected waters in the pass. Stormy weather discouraged all except the "hard cases" while cloudy-calm or sunny weather brought out the crowds.

The creel census on freshwater was conducted as opportunity permitted. This method is widely recognized to provide only general trends at best and this case was no exception. Fishing pressures in the Ketchikan area are usually light by comparison with effort in the other states and it is not at all unusual to spend a weekend on the Naha River or Fish Creek (both good fishing streams close to Ketchikan) and find no anglers. A check of this biologist's field log of days on lakes and streams reveals 31 days at fishing locations over the project period; on 8 of these 31 days other anglers were checked. On these

8 days, 21 anglers took 14 Dolly Varden, 11 rainbow and 4 steelhead in 89 angler hours. With the exception of the cutthroat catch and the take of salmon in fresh water, these meager data indicate the normal yield of the Ketchikan area freshwater sport fishery.

Facilities for anglers were considered separately for the saltwater fishery and the lake and stream fishery. Due to the limited road system of the Ketchikan area, there are few recreational developments compared to like areas in the contiguous 48 states.

There are boat liveries for saltwater anglers at Clover Pass and at Mountain Point - the two popular Ketchikan saltwater sport fishery areas. Tackle, bait, fuel and boats may be rented. Only one operator, Clover Pass Resort, has cabins for rent. Otherwise, the angler must reside in one of Ketchikan's hotels. Boats can be launched at Peninsula Point aircraft ramp or in Knudsen's Cove on Clover Pass. The 24-foot difference between high and low tides presents a timing problem to the angler who has his boat on a trailer. A resort at Bell Island also caters to anglers. All the needs of the sport angler are provided for here including quarters, meals and a swimming pool.

Facilities for the freshwater angler are of a different type than for the saltwater fisheries. Trails and shelters from the beach or other access points are provided by the Tongass National Forest at a number of the better fishing spots. The trails begin on the beach, usually near stream mouths and follow the easiest route to the lake where often a shelter and a skiff is provided for angler use. The Naha River has a mooring float at the head of navigation, a picnic area and tramway around the salt chuck, a shelter at the Orton Ranch, a shelter at the head of Jordan Lake and a shelter near the outlet of Heckman Lake, all connected by six miles of trail. There is also a shelter at the head of Heckman Lake and two shelters on Patching Lake which are reached by plane. No other stream system in the Ketchikan area is as well developed for the outdoor enthusiast and angler.

The commonly inclement weather restricts angler access by grounding aircraft or because of rough water conditions between the boat moorage and the desired fishing

spot. This factor is ever present in the Ketchikan area. It is not uncommon for a party of anglers to be flown in and the weather to foul up and keep them on location longer than expected. However, wet weather is no deterrent to the average angler if it is not too severe to get to the fishing, fish and get back again.

The species distribution of sport-caught fish was noted from creel census and observations by the writer. Migrations, as they occur, reflect in the catch and are also noted. Again, the simplest explanation is by separating the salt and freshwater fisheries.

a. In the saltwater fishery, the most popular fish is the king salmon which is present all year in the Ketchikan area. Very few anglers seek out the fish before May 1 or after August 31. During this period is when the largest kings are taken. These large fish are adults on the way to their spawning grounds. The occasional angler may take "feeders" during the rest of the year, but the main interest is as above.

The silver salmon migrate to their spawning streams from early July to late September. The saltwater fishery effort shows an upswing at this time. The silvers, being generally more numerous than kings, are taken in greater numbers, but in the same locations. The opening of the hunting season on August 1 reduces the effort on silvers as many saltwater anglers are also hunters.

The catch noted in the creel census is rather limited in numbers of fish. No scale readings have been completed to date. However, no abnormalities show in the data collected.

The other species of fish taken in the sport fishery are mainly sedentary and available all year with possibly a vertical migration to be noted among some of them. The dogfish shark is regarded as a complete pest and appears in June. None are noted after the middle of October.

b. The freshwater fisheries concern both resident and migratory fish. Regulation prevents the taking of king salmon in fresh water. The fisheries on resident species overlap those on migratory fish in the waters accessible to saltwater species. There are resident

rainbow, cutthroat, and Dolly Varden as well as sea run populations of these fish. Silver, pink, chum and sockeye salmon enter the sport fishery in that order of popularity. The migration patterns were normal for each species and have been previously reported.

The isolated waters, particularly lakes, have purely resident populations of rainbow, cutthroat, Dolly Varden, sockeye salmon and eastern brook trout. Many of these populations have been introduced. Rainbow and eastern brook have been widely stocked. The rainbow have been well received while the eastern brook provide very little sport.

As stated in previous reports, the heavy rainfall for the Ketchikan area flushes the land surface and gives high water exchange rates in the lakes. Very little soluble nutriment collects in lakes and it is to be expected that the waters are infertile. Most of the lakes are quite deep and depths in excess of 100 feet are common, although soundings of over 400 feet have been made. The water often carries muskeg (brown, "swampy") color from the vegetative ground cover. The clearest waters are the highest lakes where ground covers are minimal.

Water analyses have shown a normal 15 ppm of hardness or less, pH's down to 5.8 or 6 and oxygen at or near saturation from surface to the bottom. None of this work was repeated.

Shallow lakes have not been extensively worked with. These "muskeg ponds" are usually less than 20 feet deep with vegetative detritus bottoms and have a tendency to "winter kill" with prolonged ice covers.

Adequate spawning ground is normally to be found accessible to the lakes either in the outlets or inlets. Several lakes that were barren on first investigation, and were subsequently planted, now have sustained populations that are spawning on gravel shores where there is a flow through the bottom into the lake.

Barriers to fish passage between lakes and the saltwater are not at all uncommon. These range from free falls to broken water cataracts and gravel seeps. They have effectively prevented the migration of fish into the lakes

or streams above and isolated the fish populations that occur there.

Water flows are stabilized by spongy ground covers to a large degree. Fluctuations certainly do occur, but are very different from those in areas without vegetative mats to hold the runoff. Heavy rains (6 inches in 24 hours) result in relatively high water flows, but there is no change in the water clarity. This is not true of recently logged off areas, however.

The lakes above timberline are notably clear by reason of sparse ground cover surrounding them. These lakes occupy glacial gouged depressions for the most part. They flow down through the timbered areas where the drainage of the forest stains them brown. This "muskeg" color is characteristic of the low lakes and lowland drainage.

Stomach samples of fish taken on various surveys indicate a high dependence on insect material, both aquatic and terrestrial. Other items noted were fish (cottoids, small specimens of salmonoids, sticklebacks), crustaceans, fish spawn, pea clams, leeches and other worms, with occasionally a mouse or nestling bird that had fallen into the stream.

Physical characteristics of the lake basins were visually noted. Many lakes are entirely surrounded by steep bedrock which extends well down into the lake, resulting in relatively low food production for these areas. Inlet streams have delta areas which fall off steeply, but support considerable beds of vegetation such as nuphar, potamogeton, valisnaria, chara, algae, water plantain, etc.

A continuing search is being made for a location where a spawn taking station can be set up. The main criterion demands a water flow that can be handled without great capital outlay for weir and traps and provides adequate runs of desirable fish. A shortage of personnel during the summer season resulted in very few locations specifically checked for this purpose. Snake Creek on Etolin Island was checked on May 10. The stream has been weired for salmon, but from observations made to this date, the steelhead run was judged too small for the requirements.

Several other streams were inspected in the course of normal activity. Three of these are in Helm Bay on the Cleveland Peninsula. They are:

Helm Lake Outlet.....Minor steelhead run
Gold Standard Creek.....Insignificant fish runs
Boulder Creek.....Flash floods and no known steelhead run

Short Creek in Short Bay, Cleveland Peninsula was also inspected, but found too wild to handle. Also, most of the steelhead noted here carry a cutthroat mark casting some doubt on the purity of the strain of fish.

The information gathered to date indicates that the resident freshwater fish are presently receiving extremely light angling pressure.

The anadromous salmonoids in freshwater are being fished more heavily as the human population increases in the area. Close check must be maintained to prevent over exploitation of vulnerable concentrations of these fish. Constant study must be maintained on these fish runs and regulations adopted which are designed to allow a maximum utilization while maintaining a sustained yield.

The saltwater fish taken by the sport fishery are not being heavily harvested in the Ketchikan area with the exception of the king and silver salmon. These latter two also support a great commercial fishery and the decrease in numbers of these has been due to loss of their spawning grounds and heavy exploitation for sale. The sport fish regulations on these fish as they apply to the Ketchikan area are thought adequate at the present time to prevent further depletion of the stocks of fish in the salt water.

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Date: June 22, 1964

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